

CLAIMS

What is claimed is:

① A phosphor comprising a perovskite structure which includes sulfur and satisfies the following relation:



where M is an alkali earth metal and A is a rare earth element.

2. The phosphor of claim 1, wherein the alkali earth metal is an element selected from the group consisting of magnesium (Mg), strontium (Sr), calcium (Ca), and barium (Ba).

3. The phosphor of claim 1, wherein the rare earth element is an element selected from the group consisting of cerium (Ce), praseodymium (Pr), europium (Eu), terbium (Tb), and thulium (Tm).

4. The phosphor of claim 1, wherein the rare earth element added to the phosphor is in a range of 0.05 - 5 mol % based on 1 mol of Ti.

5. The phosphor of claim 1, further comprising a Group 13 element of the periodic table.

6. The phosphor of claim 5, wherein the Group 13 element added to the phosphor is in a range of 0.05 – 80 mol % based on 1 mol of Ti.

7. The phosphor of claim 5, wherein the phosphor is one of $\text{SrTiO}_3\text{:Pr,Al}$ which includes the sulfur and $\text{SrTiO}_3\text{:Pr,Ga}$ which includes the sulfur.

8. The phosphor of claim 5, wherein the Group 13 element is one selected from the group consisting of aluminum (Al), gallium (Ga), indium (In), and thallium (Tl).

9. The phosphor of claim 8, wherein the Group 13 element added to the phosphor is in the range of 0.05 - 80 mol % based on 1 mol of Ti.

10. The phosphor of claim 1, wherein the sulfur contained in the phosphor is added in a form of a sulfur element or an alkali metal sulfate.

11. The phosphor of claim 10, wherein the alkali metal sulfate is $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ or Na_2SO_4 .

12. The phosphor of claim 1, wherein the sulfur contained in the phosphor is in the range of 0.1 – 10 wt % based on a total weight of the phosphor.

13. The phosphor of claim 1, wherein
the alkali earth metal is an element selected from the group consisting of Mg, Sr, Ca, and Ba, and
the rare earth element is an element selected from the group consisting of Ce, Pr, Eu, Tb, and Tm.

14. The phosphor of claim 13, wherein the sulfur contained in the phosphor is added in a form of a sulfur element or an alkali metal sulfate.

15. The phosphor of claim 14, wherein the rare earth element added to the phosphor

is in a range of 0.05 – 5 mol % based on 1 mol of Ti.

16. The phosphor of claim 15, wherein the sulfur contained in the phosphor is in a range of 0.1 – 10 wt % based on a total weight of the phosphor.

17. The phosphor of claim 15, wherein the alkali metal sulfate is $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ or Na_2SO_4 .

18. The phosphor of claim 17, further comprising a Group 13 element selected from the group consisting of Al, Ga, In, and Tl.

19. The phosphor of claim 18, wherein the Group 13 element added to the phosphor is in a range of 0.05 – 80 mol % based on 1 mol of Ti.

20. The phosphor of claim 19, wherein the phosphor is one of $\text{SrTiO}_3:\text{Pr},\text{Al}$ which includes the sulfur and $\text{SrTiO}_3:\text{Pr},\text{Ga}$ which includes the sulfur.

21. A phosphor with a host matrix having a perovskite structure which include sulfur, an alkali earth metal and a rare earth element, wherein sulfur atoms partially substitutes oxygen atoms so as to vary lattice parameters of the phosphor.

22. A fluorescent display device comprising the phosphor of claim 1.

23. The fluorescent display device of claim 22, wherein the fluorescent display device is one of a field emission display and a vacuum fluorescent display.